

Amendments to the Specification:

Please amend the specification as follows:

Please replace paragraph starting at page 4, paragraph number [0015], with the following rewritten paragraph:

A first mobile communication system in accordance with the present invention is a mobile communication system comprising a wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal, wherein: the wireless apparatus comprises[[::]] channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, and one or more equalizers for equalizing the received signals signal using the filter weight calculated by the weight calculating means; the channel vector estimating means estimates channel vectors at the multipath timing and a number of channel vectors in the neighborhood of the multipath timing; and the channel matrix generating means generates the Channel matrix using the channel vectors at the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

Please replace paragraph starting at page 5, paragraph number [0016], with the following rewritten paragraph:

A second mobile communication system in accordance with the present invention is [[a]] first mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing a received signals, wherein the wireless apparatus comprises: channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is required needed for [[a]] the channel condition; and selecting means for operating each equalizer to equalize the received

~~signals if signal when~~ the judging means determines that the equalization by each equalizer is ~~required needed~~ for the channel condition, and suppressing the equalization [[off]] ~~for~~ the received signals [[if]] ~~when~~ the judging means determines that the equalization by each equalizer is not ~~required needed~~ for the channel condition.

Please replace paragraph starting at page 5, paragraph number [0017], with the following rewritten paragraph:

A third mobile communication system in accordance with the present invention is [[a]] ~~the first or second~~ mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal, wherein: the wireless apparatus comprises channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means and based on a multipath state, whether equalization by each equalizer is ~~required needed~~ for ~~the~~ a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] ~~when~~ the judging means determines that the equalization by each equalizer is ~~required needed~~ for the channel condition, and suppressing the equalization [[of]] ~~for~~ the received signals [[if]] ~~when~~ the judging means determines that the equalization ~~by~~ each [[the]] equalizer is not ~~required needed~~ for the channel condition.

Please replace paragraph starting at page 6, paragraph [0018], with the following rewritten paragraph:

A fourth mobile communication system in accordance with the present invention is a mobile communication system comprising a wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), wherein: the wireless apparatus comprises: channel vector estimating means for estimating channel vectors according to the plural multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby

generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, one or more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means, and finger rake means for conducting ordinary reception according to the multipath timings detected by the multipath timing detecting means; and the channel vector estimating means estimates channel vectors of the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and the channel matrix generating means generates the Channel matrix using the channel vectors of the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

Please replace paragraph starting at page 6, paragraph number [0019], with the following rewritten paragraph:

A fifth mobile communication system in accordance with the present invention is [[a]] the fourth mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), wherein the wireless apparatus comprises: channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is required for [[a]] the channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is required needed for the channel condition, and making the received signals signal pass finger rake means to thereby suppress the equalization by each equalizer.

Please replace paragraph starting at page 7, paragraph number [0020], with the following rewritten paragraph:

A sixth mobile communication system in accordance with the present invention is [[a]] the fourth or fifth mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal and

conducting communication using a Code Division Multiple Access (CDMA), wherein: the wireless apparatus comprises: channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means, whether equalization by each equalizer is ~~required~~ needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and making the received signals pass finger rake means to ~~suppressing~~ suppress the equalization by each equalizer.

Please replace paragraph starting at page 7, paragraph number [0021], with the following rewritten paragraph:

A seventh mobile communication system in accordance with the present invention is [[a]] one of the fourth to sixth mobile communication system systems comprising a wireless apparatus including one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), wherein:

the wireless apparatus comprises[[:]] channel judging means for judging, according to a criterion that at least the number of codes to be multiplexed is equal to or more than a fixed value, whether equalization by each equalizer is ~~required~~ needed for a channel condition;

and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and making the received signals pass finger rake means to ~~suppressing~~ suppress the equalization by each equalizer.

Please replace paragraph starting at page 8, paragraph number [0022], with the following rewritten paragraph:

A first wireless apparatus in accordance with the present invention is a wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal, comprising:

channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix

generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, and one or more equalizers for equalizing the received signals signal using the filter weight calculated by the weight calculating means, wherein: the channel vector estimating means estimates channel vectors at the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and the channel matrix generating means generates the Channel matrix using the channel vectors at the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

Please replace paragraph starting at page 8, paragraph number [0023], with the following rewritten paragraph:

A second wireless apparatus in accordance with the present invention is [[a]] the first wireless apparatus comprising one or more equalizers for equalizing received signals, comprising: channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is required needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is required needed for the channel condition, and suppressing the equalization for the received signals [[if]] when the judging means determines that the equalization by each equalizer is not required needed for the channel condition.

Please replace paragraph starting at page 9, paragraph number [0024], with the following rewritten paragraph:

A third wireless apparatus in accordance with the present invention is [[a]] the first or second wireless apparatus comprising one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal, comprising: channel judging means for judging, according to the

multipath timings detected by the multipath timing detecting means and based on a multipath state, whether equalization by each equalizer is ~~required~~ needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and suppressing the equalization for the received signals [[if]] when the judging means determines that the equalization by each equalizer is not ~~required~~ needed for the channel condition.

Please replace paragraph starting at page 9, paragraph number [0025], with the following rewritten paragraph:

A fourth wireless apparatus in accordance with the present invention is a wireless apparatus comprising multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), comprising: channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, one or more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means, and finger rake means for conducting ordinary reception according to the multipath timings detected by the multipath timing detecting means; wherein: the channel vector estimating means estimates channel vectors of the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and the channel matrix generating means generates the Channel matrix using the channel vectors of the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

Please replace paragraph starting at page 10, paragraph number [0026], with the following rewritten paragraph:

A fifth wireless apparatus in accordance with the present invention is [[a]] fourth wireless apparatus comprising one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), comprising: channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is ~~required~~ needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and making the received signals signal pass finger rake means to thereby suppress the equalization by each equalizer.

Please replace paragraph starting at page 10, paragraph number [0027], with the following rewritten paragraph:

A sixth wireless apparatus in accordance with the present invention is [[a]] the fourth or fifth wireless apparatus comprising one or more equalizers for equalizing a received signals signal and multipath timing detecting means for detecting multipath timings in [[a]] received signal signals using a known signal and conducting communication using a Code Division Multiple Access (CDMA), comprising: channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means, whether equalization by each equalizer is ~~required~~ needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and making the received signals pass finger rake means to suppressing suppress the equalization by each equalizer.

Please replace paragraph starting at page 11, paragraph number [0028], with the following rewritten paragraph:

A seventh wireless apparatus in accordance with the present invention is [[a]] one of the fourth to sixth wireless apparatus comprising one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access

(CDMA), comprising[[;]]: channel judging means for judging, according to a criterion that at least the number of codes to be multiplexed is equal to or more than a fixed value, whether equalization by each equalizer is ~~required~~ needed for a channel condition; and selecting means for operating each equalizer to equalize the received signals [[if]] when the judging means determines that the equalization by each equalizer is ~~required~~ needed for the channel condition, and making the received signals pass finger rake means to ~~suppressing~~ suppress the equalization by each equalizer.

Please replace paragraph starting at page 11, paragraph number [0029], with the following rewritten paragraph:

That is, the first mobile communication system in accordance with the present invention comprises multipath timing detecting means for detecting multipath timings, channel matrix generating means to be used to generate a Channel matrix for an equalizer by estimating a channel characteristic according to the multipath timings, and weight calculating means for calculating [[a]] an equalizing filter weight using the matrix. The channel matrix generating means uses not only the propagation ~~channels~~ channel of the multipath timings, but also propagation channels in the neighborhood of its position.

Please replace paragraph starting at page 11, paragraph number [0030], with the following rewritten paragraph:

The second mobile communication system in accordance with the present invention comprises channel estimating means for conducting, for the state of the received signals, at least one of estimation of a Signal to Interference power Ratio (SIR), estimation of a Signal to Noise power Ratio (SNR), estimation of a signal to noise interference power ratio, estimation of a multipath number, estimation of a multipath interval, and estimation of a delay deviation; judging means for judging whether an equalizer is ~~required~~ needed according to, ~~a condition, for example,~~ whether the estimated value is equal to or more than a preset threshold value; and selecting means for operating the equalizer to make the received signals pass the equalizing filter [[if]] when the equalizer is required for a channel condition, and for making

the received signals to detour the equalizing filter [[if]] when the equalizer is not required needed for the channel condition and for stopping operation of the equalizer.

Please replace paragraph starting at page 12, paragraph number [0031], with the following rewritten paragraph:

The third mobile communication system in accordance with the present invention comprises channel judging means for judging whether the channel state is suitable for an equalizer by comparing the number and the interval of the multipath timings outputted from the multipath timing detecting means with preset threshold values, and selecting means for stopping, according to the judgment, the equalizer [[if]] when the channel condition is not suitable for for operation of the equalizer.

Please replace paragraph starting at page 13, paragraph number [0034], with the following rewritten paragraph:

The sixth mobile communication system in accordance with the present invention operates in a communication system of a Code Division Multiple Access (CDMA) system and comprises multipath timing detecting means for supplying timing to the fingers used in the finger rake reception, detection judging means for detecting the state of the received signals through SIR detection or the like, and selecting means for making an equalizer effective [[if]] when the SIR is equal to or more than an arbitrary threshold value and stopping the equalizer and making the finger rake reception effective [[if]] when the SIR is equal to or less than an arbitrary threshold value.

Please replace paragraph starting at page 13, paragraph number [0035], with the following rewritten paragraph:

The seventh mobile communication system in accordance with the present invention comprises channel estimating means for conducting, for the state of the received signals, at least one of estimation of the SIR, estimation of the SNR, estimation of the signal to noise interference power ratio, estimation of the multipath number, estimation of the multipath interval, and estimation of the delay deviation; judging means for judging whether an

equalizer is ~~required~~ needed, according to a condition, for example, whether the estimated value is equal to or more than a preset threshold value; and selecting means for operating the equalizer for making the received signals pass the equalizing filter [[if]] when the equalizer is ~~required~~ needed for a channel condition, and for making the received signals to detour the equalizing filter [[if]] when the equalizer is not ~~required~~ needed for the channel condition and for stopping operation of the equalizer.

Please replace paragraph starting at page 14, paragraph number [0036], with the following rewritten paragraph:

The eighth mobile communication system in accordance with the present invention comprises channel judging means for judging whether the channel state is suitable for an equalizer by comparing the number and the interval of the multipath timings outputted from the multipath timing detecting means with preset threshold values, and selecting means for stopping, according to the judgment, the equalizer [[if]] when the channel condition is not suitable for operation of the equalizer.

Please replace paragraph starting at page 14, paragraph number [0037], with the following rewritten paragraph:

The ninth mobile communication system in accordance with the present invention operates in a communication system of the CDMA system and comprises multipath timing detecting means for supplying multipath timings to both of finger rake receiving means for ordinary reception and equalizing means for equalizing reception, and selecting means for selectively using the equalizing means and the finger rake receiving means.

Please replace paragraph starting at page 16, paragraph number [0044], with the following rewritten paragraph:

The base station 1 includes a channel encoding section 11, a base-station modulating section 12, a base-station transmitting section 13, a base-station transmitting antenna 14, a base-station receiving antenna 15, a base-station receiving section 16, a base-station multipath

timing detecting section 17, one or more equalizers 18, a base-station demodulating section 19, and a base-station channel decoding section 20.

Please replace paragraph starting at page 16, paragraph number [0045], with the following rewritten paragraph:

The mobile station 2 includes a mobile-station receiving antenna 21, a mobile-station receiving section 22, a mobile-station multipath timing detecting section 23, one or more equalizers 24, a mobile-station demodulating section 25, a mobile-station channel decoding section 26, a speaker 27, a display section 28, a microphone 29, an input terminal 30, a mobile-station channel encoding section 31, a mobile-station modulating section 32, a mobile-station transmitting section 33, and a mobile-station transmitting antenna 34.

Please replace paragraph starting at page 20, paragraph number [0058], with the following rewritten paragraph:

In the examples shown in (a) and (b) of FIG. 5, first timing t_0 having ~~the maximum a..~~
large delay profile is detected as a multipath timing. The timing near t_0 is masked to keep a fixed detection path interval and then t_1 , the second largest delay profile, is detected.

Please replace paragraph starting at page 21, paragraph number [0060], with the following rewritten paragraph:

As shown in (a) of FIG. 5, the channel vector estimating section 181 multiplies, according to multipath timings t_0 and t_1 ~~of the multipath timings~~ sent from the base-station multipath timing detecting section 17, or the mobile-station multipath timing detecting section 23, a complex conjugate of a known pilot signal by the signal from the base-station receiving section 16 or the mobile-station receiving section 22 to conduct averaging (de-spreads the pilot signal in the case of CDMA to conduct averaging) to thereby estimate channel vectors h_0 and h_1 .

Please replace paragraph starting at page 22, paragraph number [0064], with the following rewritten paragraph:

Next, using (b) and (d) of FIG. 5, description will be given of an example in which the channel matrix generating section 183 also uses channel vectors in the vicinity of the multipath timings. Parameter Nca indicates the number of channel vectors used for one multipath timing. In the example shown in (a) of FIG. 5 described above, for one path of a multipath timing, there exists one channel vector, which is represented as Nca = 1.

Please replace paragraph starting at page 22, paragraph number [0067], with the following rewritten paragraph:

Furthermore, (e) of FIG. 5 shows an example of the Channel matrix in a case of Nca = 5 in which five channel vectors are used for one multipath timing. For each of the multipath timings of t0 and t1, there are inherently to be estimated five channel vectors h_{0-2} , h_{0-} , h_0 , h_{0+} , h_{0+2} , h_{1-2} , h_{1-} , h_1 , h_{1+} , and h_{1+2} which are Ttap apart from each other. However, in this example, channel vectors h_0 and h_1 are apart from each other only by $4 \times Ttap$ (sec), and hence the path position of the channel vector h_{0+2} is equal to that of channel vector h_{1-2} to overlap each other; that is, only one of the values is required to be used. In this case, only the channel vector h_{0+2} is obtained.

Please replace paragraph starting at page 26, paragraph number [0077], with the following rewritten paragraph:

Description will be given of the operation using (f) of FIG. 5. The embodiment is a 4-path multipath and t0, t1, t2, and t3, and t4 are transmitted as multipath timing. The multipath intervals Δt_1 and Δt_2 are more than the threshold value, but Δt_3 is less than an interval determined as the threshold value, and hence it can be determined that the multipath interference likely occurs between the paths of $t_2[[3]]$ and $t_1[[4]]3$.

Please replace paragraph starting at page 31, paragraph number [0095], with the following rewritten paragraph:

Furthermore, in the CDMA, the codes are multiplexed as shown in ~~(e) of FIG. 13~~ FIG. 13(c). The code channels are allocated, for example, as follows: Ch1 is a pilot channel 209, Ch2 is a control channel 210 to send control information, and Ch3, Ch4, and Ch5 are data

channels (211, 212, 213). In this situation, since the number of data channels varies depending on the number of users and traffic at that point of time, the number of codes to be used changes. The code number judging section 565 switches "effective" between "ineffective" for the equalizer according to the change in the number of codes.

Please replace paragraph starting at page 34, paragraph number [0103], with the following rewritten paragraph:

- 1, 5 Base station
- 2, 6 Mobile station
- 11 Channel encoding section
- 12 Base-station modulating section
- 13 Base-station transmitting section
- 14 Base-station transmitting antenna
- 15 Base-station receiving antenna
- 16 Base-station receiving section
- 17 Base-station multipath timing detecting section
- 18, 24, 512, 522, 532, 542, 552, 562 Equalizer
- 19 Base-station demodulating section
- 20 Base-station channel decoding section
- 21 Mobile-station receiving antenna
- 22 Mobile-station receiving section
- 23 Mobile-station multipath timing detecting section
- 25 Mobile-station demodulating section
- 26 Mobile-station channel decoding section
- 27 Speaker
- 28 Display section
- 29 Microphone
- 30 Input terminal
- 31 Mobile-station channel encoding section
- 32 Mobile-station modulating section

33 Mobile-station transmitting section
34 Mobile-station transmitting antenna
51 - 56, 61 Equalizing section
100 Propagation channel
181 Channel vector estimating section
182 Noise estimating section
183 Channel matrix generating section
184 Weight calculating section
185 Equalizing filter
511, 521, 531, 541, 551, 561 Multipath timing detecting section
513, 535 Before-combination channel state estimating section
514, 536, 546 Judging section
515, 516, 524, 525, 537, 538, 547, 548, 556, 557, 566, 567 Selecting section
517, 526 Demodulating section
523 Channel judging section
533, 543, 553, 563 De-spreading section
534, 544, 554, 564 Finger rake section
545 After-combination channel state estimating section
555 Channel judging section
565 Code number judging section
1851 Shift register group
1852 Weight multiplying section
1853 Adding section